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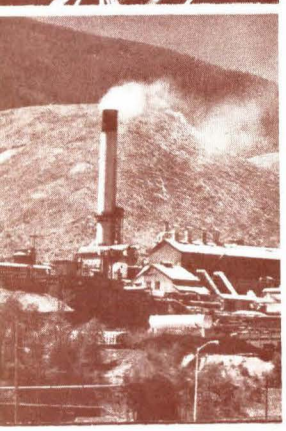

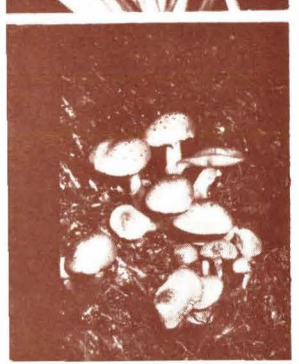

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EVALUATION OF A MOUNTAIN PINE BEETLE INFESTATION, STONEY CREEK, NINEMILE DISTRICT, LOLO NATIONAL FOREST - 1975

by

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ABSTRACT

Mountain pine beetle populations reached epidemic levels in 1972 in the Stoney Creek drainage, Ninemile District, Lolo National Forest, Montana. A total of 8,082 trees with an estimated volume loss of 34,356 board feet has occurred from 1972 to 1974. Buildup ratio was 1:1.2 from 1972 to 1973, and 1:1.8 from 1973 to 1974. Losses are expected to increase in 1975. Commercial thinning is recommended in unthinned stands.

INTRODUCTION

Mountain pine beetle, *Dendroctonus ponderosae*, Hopk., is currently in epidemic status in overstocked, 60- to 80-year-old, second-growth ponderosa pine, *Pinus ponderosa*, Laws., stands on the Ninemile Ranger District, about 15 air miles northwest of Missoula, Montana. The Stoney Creek infestation is part of the more extensive Ninemile epidemic that began in 1969, increased through 1971, declined through 1973, then increased sharply in 1974. (Ciesla and McGregor, 1970; Ciesla, et al., 1970; Bousfield, et al. 1973.) Dry conditions that prevailed during 1973 and the latter part of 1974 probably contributed to the increase in number of attacked trees. The close proximity of trees resulted in stress for moisture during 1973-74 in the infested unthinned stands. Most ponderosa pine stands in the Ninemile area are second-growth, overstocked stands and are highly susceptible to mountain pine beetle.

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The Stoney Creek stand was free of mountain pine beetle in 1971. Populations were first detected in 1972, and numbers of trees killed have increased annually.

Because of the increased demand for small log sales and because of the increase in number of ponderosa pine killed by the mountain pine beetle in the Ninemile drainage, a survey was conducted to determine tree and volume loss estimates that occurred in the Stoney Creek area the past 3 years.

METHODS

A variable plot cruise (BA=20) was conducted during December 1974. Mountain pine beetle killed trees were tallied by year of kill, and measured at d.b.h. and total height for volume loss estimates. Unsuccessful attacks (pitchouts) were also tallied. Survey data on the 183 acres were analyzed by a modified R-1 timber sale cruise program.

RESULTS

The mountain pine beetle killed an estimated 8,082 trees with a resultant 34,356 board foot volume loss during the 3-year period 1972-1974. (Table 1).

Table 1.--Estimated tree and volume losses caused by mountain pine beetle, Stoney Creek, Ninemile District, Lolo National Forest, Montana, 1972-1974.

Year	Trees killed		Average	Volume loss (cubic feet)	
	Per acre	Total	d.b.h.	Per acre	Total
1972	12.0	2,204	13.0	972.0 1/	177,756 1/
1973	14.7	2,690	7.0	144.0 1/	26,196 1/
1974	17.4	3,188	7.0	12.0 1/	2,184 1/
Total or Average	14.7	8,082	9.0	62.6	34,356

1/Small diameter of infested trees does not permit adequate measurement of volume loss in terms of board feet.

Buildup ratio of old to newly attacked trees was 1:1.2 from 1972 to 1973, and 1:1.8 from 1973 to 1974. Number of trees killed per acre increased from 12.0 in 1972, to 14.7 in 1973, and 17.4 in 1974.

Size of trees infested ranged from 5 to 9 inches d.b.h., average 13.0 inches, in 1972; 5 to 12 inches d.b.h., average 7.0 inches, in 1973; and 5 to 15 inches d.b.h., average 7.0 inches, in 1974.

Less than 1 percent of the ponderosa pine stand has been killed during the 3-year period 1972-1974.

The number of trees killed increased yearly, but with a decrease in size of trees killed, volume loss decreased from 972 cubic feet/acre to 12 cubic feet/acre.

Approximately 25 percent of the trees attacked during the 3-year period were attacked unsuccessfully, and were classed as "pitchouts."

DISCUSSION

Second-growth ponderosa pine stands have sustained heavy losses to the mountain pine beetle on the Ninemile drainage.

The Stoney Creek infestation is part of the larger Ninemile mountain pine beetle epidemic. This area was surveyed in 1971 and found to be free of infestation. It became infested in 1972 from beetles in adjacent heavily infested stands.

Extremely dry conditions during 1973 probably resulted in additional competition for moisture, thus weakening trees making them more susceptible to bark beetle attack.

As trees become weakened or stressed, the mountain pine beetle usually kills ponderosa pines in groups, rather than scattered single trees throughout the stand. These groups enlarge with subsequent generations of beetles, resulting in large holes in the stand. Groups may include 2 or 3 to more than 100 trees. Infestations begin in trees 12 inches d.b.h. and larger, but trees down to 6 inches d.b.h. are readily killed as the infestation progresses.

In the Ninemile area, stand density appears to be closely related to incidence of mountain pine beetle infestation. The association of mountain pine beetle infestation with high stand densities of ponderosa pine has long been apparent (Eaton, 1941; Keen, 1950; Clements, 1953: Sartwell, 1969). Sartwell (1971) also measured beetle-caused mortality in eight localities in Oregon and found a significant and direct relation to stand density. Sartwell and Dolph (in press) found that 5 years after thinning in second-growth ponderosa pine stands in eastern Oregon, tree killing by mountain pine beetle on unthinned plots was at least 15 times greater than in thinned plots; also, that nearly all damage by *D. ponderosae* in thinned plots occurred where thinning was lightest.

In the 630-acre Isaacs Creek thinning block north of the Ninemile Ranger Station, mountain pine beetle caused tree mortality has been reduced to a few incidental infested trees. However, groups of currently infested trees persist in unthinned stands bordering, and also unthinned firebreaks within the thinned block.

RECOMMENDATIONS

A commercial thinning program should be implemented prior to beetle flight in May 1975, to reduce losses caused by *D. ponderosae* in the Stoney Creek area. In addition, skidding to a central landing and burning tops is recommended to minimize a population buildup of the pine engraver beetle, *Ips pini* Say.

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